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Journal of the Society of Arts.

FRIDAY, NOVEMBER 29, 1867.

Announcements by the Council.

ORDINARY MEETINGS.

Wednesday Evenings at Eight o'clock :—

DECEMBER 4.—“On the Relation between Health and Wages.” By J. H. STALLARD, Esq., M.D.

DECEMBER 11.—“On Industrial and Scientific Education; with Notes on the Systems pursued, and the Works produced, in Continental Schools, as exemplified in the Paris Exhibition, and Suggestions for the Establishment of Trade Schools in England.” By ELLIS A. DAVIDSON, Esq.

DECEMBER 18.—“On the Principles that Govern the Future Development of the Marine Boiler, Engine, and Screw Propeller.” By N. P. BURGH, Esq., C.E.

CANTOR LECTURES.

Owing to unavoidable circumstances, Dr. Crace Calvert regrets that he will be unable to give a course of lectures before Christmas, as arranged.

The first course for the present session will be “On Art, especially including the History and Theory of Sculpture,” by Richard Westmacott, Esq., R.A., F.R.S., Professor of Sculpture in the Royal Academy, and will consist of three lectures, to be delivered on Friday evenings, the 6th, 13th, and 20th December.

The second course will be “On Food,” by Dr. Letheby, Medical Officer of Health for the City of London. A third course will be given.

The following is a syllabus of Professor Westmacott's course :—

DECEMBER 6TH.—LECTURE I.—“On the Want of Public Education in Art; and How Works of Art should be looked at.”

DECEMBER 13TH.—LECTURE II.—The subject of the Introductory Lecture illustrated, by a general survey of the history and practice of Sculpture in ancient times, especially among the Greeks.

DECEMBER 20TH.—LECTURE III.—The subject continued, including a review of the mediæval and more modern schools, to the close of the eighteenth century.

The lectures will commence each evening at eight o'clock, and are open to members, each of whom has the privilege of introducing two friends to each lecture.

SUBSCRIPTIONS.

The Michaelmas subscriptions are due, and should be forwarded by cheque or Post-office order, crossed “*Countts and Co.*,” and made payable to Mr. Samuel Thomas Davenport, Financial Officer.

Proceedings of the Society.

SECOND ORDINARY MEETING.

Wednesday, November 27th, 1867; Sir DANIEL COOPER, Bart., Member of Council, in the chair.

The following candidates were proposed for election as members of the Society :—

Cox, William Sands, F.R.S., Dosthill-house, Wilneote near Tamworth.

Flavelle, Henry, 14, St. Stephen's-rd. Westbourne-pk. W. France, James Robert, 98, Rotherfield-street, N.

Hendriks, Frederick, 30, Palace-gardens-terrace, Kensington, W.

Morris, Augustus, 118, Cannon-street, E.C.

Pagliardini, Tito, Portman-street, W.

Rabbeth, George, Edinburgh-house, 13, Cornwall-road, Paddington, W.

Robert, Dr. C. Russell, Park-house, Hampton-wick.

Tindal, C. G., Marchfield-house, Bracknell, Berks.

Previously to the reading of the Paper, the Secretary called the attention of the Members to some very beautiful specimens of artificial marble, shown by the inventor, Mr. Guelton, termed “*marezzo*.” It is manufactured in the form of slabs, of large dimensions, mouldings, cornices, table-tops, &c., and imitates every variety of marble, both antique and modern. The colours and veining are traced on large surfaces of plate glass, and the cement, or material composing the artificial marble is then run over it; when set the slabs are removed from the glass. The surfaces are then polished by friction, in the same way as those of marble. The material is suitable for all internal decoration where marble is ordinarily used. It is fixed to walls by the methods usually employed for facing walls with marble.

The Paper read was—

ON THE DIPLOMATIC AND OTHER CONFERENCES HELD RECENTLY IN PARIS WITH REFERENCE TO INTERNATIONAL COINAGE, WEIGHTS, AND MEASURES.

By DR. LEONE LEVI, F.S.A., F.S.S., &c., PROFESSOR OF COMMERCIAL LAW IN KING'S COLLEGE, LONDON.

Another Universal Exhibition has just ended, the fruitful source, I hope, not only of further and still more decided progress in industrial art, but of many measures calculated to further the interests of civilization, to elevate the morals of nations, and to bring together the scattered members of the human family. It is a high merit of such International Exhibitions that they do enlarge our citizenship, and extend the bounds of our interest and regard. A narrow isolation seems altogether incompatible with them. A more generous and liberal spirit is thereby engendered, and we breathe a freer life, because the field of our horizon becomes widened, and the object of our aspirations is greater and higher. This Society may well be proud of the origination and organisation of such great undertakings; and the success of the first, and of each successive exhibition, must for ever redound to her praise and glory. By it she has indeed encouraged “*Arts, Manufactures, and Commerce*.” A new era, of loftier conceptions and greater attainments, has thereby been inaugurated; and what is still more solid and expansive, seeds have been sown the fruits of which will continue to be seen, in a higher civilization, nobler

sentiments, and, I trust, more permanent peace among the nations of the world. All honour to those foremost minds—princes, indeed, in rank, talent, and heart—who have rendered a service so signal to the world and to humanity. And may this Society, whose history is associated with almost every discovery of practical science which has rendered this country illustrious, ever count among its members men of high thought, large views, and liberal mind, who, by their energetic labours and benevolent designs, will succeed in maintaining the Society in the noonday splendour of usefulness and glory.

It was the Universal Exhibition that first gave to the proposal of establishing one common system of weights, measures, and coins, in all countries, a decided prominence. In ancient times the Latin tongue was the universal language of science. Amidst the jargon of so many hordes of barbarians, and the confusion of unknown tongues, men of science could still speak to one another in a language universally known. And when we endeavour to fathom the problems of industrial and scientific discoveries, with which these great exhibitions abound, the want comes home to all of us, of some ready means for mastering those instruments of calculation which enter so closely into the conception and execution of the works of art of every country. The evils arising from the great confusion in the weights, measures, and coins in use in all states, had indeed long been experienced. Men of science of all countries most liberally deposit fruitful gems of thought and discovery in their memoirs and transactions, that they may become the heritage of mankind; yet, though reduced to the certainty of numbers, they often fail to pass to the apprehension of the world, from the discordant methods pursued in their exposition. With the great facility of communication by land and by sea, thought flashing through the air, and penetrating the depth of the ocean, and with a liberal commercial policy, the interchange of produce and manufactures between different countries is increasing at a most rapid pace, yet everywhere the same difficulties arrest progress, and, in many cases, absolutely hinder the increase of trade. Happily, the Society of Arts, still fresh in the recollection of the advantages of the glorious Exhibition of 1851, seized the moment, when public attention in the country was directed to the decimalization of the coinage, for generalising a question which had hitherto been apprehended solely from a narrow national aspect, and from that moment the attainment of universal uniformity in such instrument of exchange ceased to be theoretical and hyperbolic, and received the countenance of thoughtful and wise men of all countries. In their memorial to the Lords Commissioners of her Majesty's Treasury,* in the year 1853, the Society of Arts, after urging the importance of a system of decimal coins, weights, and measures, in advancing, the arts, manufactures, and commerce of the country, pointed out how the growing intelligence and education of every people were sweeping away those feelings of personal antipathy which formerly existed; and how much the beneficent result would be increased by facilitating international relations; that a uniformity in measures, weights, and coins would be of the utmost importance to commerce; and in measures and weights especially, would greatly facilitate scientific research. They submitted, as a matter of grave consideration, whether, in introducing a change to a decimal system of coins, weights, and measures, some arrangements might not be made with neighbouring nations for the adoption of a uniform system throughout the world; that sooner or later such a system would be loudly called for by different nations, and the inconvenience of a second change might be obviated by a little judicious forethought; that it was worthy of the country which had inaugurated "un-

restricted commerce," "unrestricted navigation," and which invited, by its exhibitions and by its policy, the most unrestricted competition, "to make the first advances towards such a glorious act; and that there was nothing impossible in the idea, since several nations on the Continent of Europe have already the same coinage, and the metrical system of weights and measures is still more widely adopted."

In 1853, the International Statistical Congress was first inaugurated in Brussels, for the purpose of establishing a complete body of national statistics in all countries, scientifically classified, and so prepared as to be readily comparable among themselves; but the importance of a uniform system of measures, weights, and coins, forced itself upon the attention of the Congress as a great obstacle to the study of comparative statistics, and a resolution was passed, recommending that in the statistical tables of countries not possessing the metrical system, a column should be added, indicating the metrical reduction of weights and measures. In 1855, at the International Exhibition in Paris, the jurymen and commissioners of the Exhibition signed a declaration in favour of a universal system of weights and measures, and earnestly recommended the same to the consideration of their respective governments, and of enlightened individuals, friends of civilisation, and advocates of peace and harmony throughout the world. Again, in that same year, at the second session of the International Statistical Congress, held at Paris, another resolution was passed, in the following form:—"The Congress, considering how much the adoption by different nations of a uniform system of measures, weights, and coins, would facilitate the comparative study of the statistics of different countries, resolves that it is desirable to put such a uniform system into energetic practice." And, ere the second Universal Exhibition closed, with all its happy influences on commerce, science, and international relations, an international association was formed for obtaining a uniform decimal system of measures, weights, and coins, mainly by the energetic and wisely-directed efforts of Earl Fortescue and Mr. James Yates, who thenceforth bestowed on the attainment of this object their unremitting zeal, labour, and talent. Into the action of this association I shall not enter, further than stating that, at its fourth general meeting, held at Bradford in 1859, M. Michel Chevalier, Member of the Institute, in the chair, a resolution was passed—"That the metric system now in use in France, and many states in Europe and America, being founded on a scientific basis, and being complete and homogeneous in all its divisions, has indisputable claims, at least in its fundamental principles, to universal adoption, reserving for the discretion of the different states to adopt such nomenclature for the same as may best facilitate the introduction of the system." This resolution having put an end to all doubts and discussions on the special system to be advocated as a basis of uniformity, for weights and measures, immensely strengthened the position of the association, and thenceforth it gave itself, by every means in its power, to promote the extension of the metric system throughout the world. As regards coins, the time was unfavourable to the enunciation of any specific scheme. Many suggestions had been made, of more or less practical importance, but the majority of them viewed the question from a purely national aspect. The legislature itself seemed most perplexed. In 1847 Sir John Bowring made a motion for an address to the Crown in favour of the coinage and issue of silver pieces of the value of one-tenth and one-hundredth of a pound sterling, avowedly as a step to the complete introduction of the decimal division of the pound; and soon after the florin was issued. In 1853, on the motion of the late Sir William Brown, a Committee of the House of Commons was appointed to take into consideration and report on the practicability and advantages, or otherwise, that would arise from adopting a decimal system of

* See *Journal*, Vol. I. p. 205.

coinage, and the report was highly favourable to the decimal system, recommending the pound sterling as the unit of the new system of coinage. Yet, when in 1855 Sir W. Brown moved resolutions expressing satisfaction at the issue of the florin, and recommending the issue of silver coins to represent the value of one-hundredth part of a pound, and copper coins to represent the one-thousandth part of a pound, to be called cents and mills respectively, the resolution of the florin was only carried by a majority of 135 to 56, and those advocating further progress in that measure had to be withdrawn. The next step, in 1855, was the issue of the Royal Commission, in which Lord Overstone took a conspicuous part, and with their report, which was in every way most unsatisfactory, the efforts to advance a measure of so much importance received a decided check.* But the International Exhibition of 1862 again revived the necessity of definite action on the whole subject, and on the motion of Mr. Ewart, M.P., a committee of the House of Commons was appointed to consider the practicability of adopting a simple and uniform system of weights and measures, with a view not only of benefiting our internal trade, but of facilitating our trade and intercourse with foreign nations, and the result was the unanimous recommendation to introduce into this country the metric system of weights and measures by legalising the use of the system, sanctioning its introduction into public offices, and making it the subject of examination in schools receiving grants. A Bill was thereafter introduced on the subject, and it became the Act† now in force, which "legalises or renders permissive the use of the metric system."

In 1864, the British Association for the Advancement of Science nominated a committee to prepare a report on the best means of providing for a uniformity of weights and measures, with reference to the interests of science, and it also recommended the adoption of the metric system. That committee, under the presidency of Sir John Bowring, has been reappointed from year to year with grants from the funds of the association, and an evidence of the gradual change of public opinion on the subject is shown in the fact that, whereas some years ago the metric system met with but few supporters at the British Association meetings, now the object is attracting every year increased attention, whilst the discussions became more animated, several sections being almost unanimous in the advocacy of the metric in preference to any other system. At home and abroad the question continued to excite the greatest attention. The International Statistical Congress, at its meeting in London in 1860, under the presidency of the lamented Prince Consort, nominated an international commission for the purpose of preparing a formal report on the whole subject to the following Congress, and at its meeting in Berlin, in 1863, the Congress resolved, as regards weights and measures, "That the adoption of the same measure in international commerce is of the highest importance, and that the metric system appears to be the most convenient of all that could be recommended for international measure; that the arrangements and rules to be followed in the construction of the standards and in the introduction of this system should

be confided to an international commission, which should also be charged with the duty of ascertaining the means of correcting the slight defects in the original standards." And as regards coins, "That the existing units of money be reduced to a small number; that each unit should be as far as possible decimally subdivided; that the coins in use should all be expressed in weights of the metric system, and should all be of the same degree of fineness, namely, nine-tenths fine and one-tenth alloy." Lastly, towards the end of 1865, a monetary treaty was concluded between France, Belgium, Italy, and Switzerland, by which the money of the respective states might be rendered legal in all the others; by Article 12 of which "the right of accession to the convention was reserved to any other state which would accept the obligations, and would adopt the monetary system of the union in what concerned the gold and silver specie." Such was the state of the question prior to the conferences, the proceedings of which I have now the honour to place before the Society.

In anticipation of the Universal Exhibition held in Paris, the Metric Committee of the British Association, and the Council of the International Decimal Association, suggested to the Imperial Commissioners of the Universal Exhibition the organisation of a special exhibition of the weights, measures, and coins of all countries, and by their desire, in May, 1866, I proceeded to Paris to confer with the Commissioners on the subject. M. Le Play thereupon invited the Commissioners for the Exhibition to meet me, and, the proposal having been unanimously accepted in the terms of a note which I read on the occasion, the Imperial Commissioners decided that a special place be appropriated for an international exhibition of measures, weights, and coins of all countries in the vestibule of the palace. A special committee from the scientific commission was also established (in which I had the honour of being nominated) to preside over the formation of the exhibition, and such committee was also empowered to use the most efficacious means for taking advantage of the universal gathering of 1867 for the promotion of a uniform system of measures, weights, and coins. The committee forthwith proceeded to the organisation of the exhibition, and having received the aid and co-operation of all countries, we were able to erect the beautiful pavilion erected in the centre of the palace, with the weights, measures, and coins, bank-notes, postage-stamps, and calendars of all nations, arranged with great symmetry and elegance, which daily attracted a large crowd of visitors. Nor were we content with the silent lesson which such an exhibition was calculated to afford. A great conference was appointed to be held to discuss the mode of removing the many discrepancies thus palpably exhibited; and having divided ourselves into three sub-committees it was arranged to prepare special reports on weights and measures, coinage, and areometry, which might serve as a basis of discussion. The conference was appointed to be held in June, and to it were invited some of the foremost men then in Paris from all countries, including official delegates and commissioners from foreign states or scientific societies. The metric committee of the British Association and the British branch of the International Association were represented by Mr. Samuel Brown and myself, and we had the pleasure of associating with us M. Louis P. Casella, the constructor of the mural standard. The Chamber of Commerce of Liverpool was represented by Mr. Edward K. Musprat, Member of the Council, and Mr. William Blood, Secretary. For the Huddersfield Chamber of Commerce there was Mr. Wrigley, and Colonel Younghusband represented the British Commission at the Universal Exhibition. On the 27th June, 1867, the conference met at the Palais de l'Industrie. M. Mathieu, of the Bureau de Longitude, Chairman of the Committee, presided over the first two meetings, but a communication having been made that his Imperial Highness Prince

* The 9th and 12th resolutions of the Royal Commissioners gave the following, among other important reasons, against the adoption of the pound and mil scheme:—

"9. That the particular form of decimal coinage proposed as the pound and mil scheme cannot be looked upon as a well-assured or demonstrated improvement on our present coinage; but must rather be considered as an experiment of very doubtful result, accompanied, beyond all question, by many serious transitional difficulties."

"12. That, duly weighing the foregoing considerations, it does not appear desirable, under existing circumstances, while our weights and measures remain as at present, and so long as the principle on which their simplification ought to be founded is undetermined, to disturb the established habits of the people with regard to the coins now in use, by a partial attempt to introduce any new principle into the coinage alone."

† 27 and 28 Vict., c. 117, 29 July, 1864.

Napoleon would accept the presidency, he was unanimously elected to that office, which he filled, I must say, with consummate skill and tact, and showing a business capacity not often met with. The report on weights and measures was prepared by M. Jacobi, member of the Imperial Academy of St. Petersburg. Having laid down, as primary propositions, that the decimal system is the best adapted to express multiples and sub-multiples of weights, measures, and coins; that the metric system has the greatest claim to universal adoption; and that the adoption of such would produce great economy of labour, tantamount to a decided increase of wealth, M. Jacobi exhibited the position of the question in different countries. He stated that France, Belgium, the Netherlands, Italy, the Pontifical States, Spain, Portugal, Greece, Mexico, Chili, Brazil, New Grenada, and the Republics of South America, have already accepted the metric system in an obligatory manner; that in England and the United States it is now legal but not compulsory; that Switzerland, Sweden, Prussia, Baden, Bavaria, Austria, Wurtemberg, and Denmark have borrowed certain portions of the system; that in Russia and other countries the existing systems could easily be adapted to the metric, and that only some coasting states of the Mediterranean, Turkey, Greece, and Egypt, have systems which have no relation with the metric. In his opinion, the fact that the metric system was already so extensively in use, encouraged the desire and established the necessity of rendering it universal. M. Jacobi exhibited the great advantages of teaching it in the primary schools, and of using it in science and scientific publications, in commercial transactions, industry, and mechanics, the postal tariff, telegraphs, and customs. He was in favour of using the proper nomenclature of the metric system, and no other, and did not sanction the combination of the metric with any existing system, even as a measure of transition; and concluded with recommending the immediate teaching of the metric system in schools, and the use of the same in statistical and other public departments. A report so complete and judicious could not fail to be received with great favour, and it was adopted unanimously. In fact, it became almost unnecessary to discuss it at any length, seeing that nearly every one of the members present was prepared for the adoption of the metric system, and the merits of the reform had been canvassed freely and thoroughly in so many occasions. In consequence of some observations made on the state of preservation of the original standard, it was stated by General Morin, of the Conservatoire des Arts-et-Metiers, that in 1863 the Minister of Agriculture, Commerce, and Public Works of France, appointed a commission to make an official comparison between the prototype standards of the meter and kilogram kept at the archives, with that deposited at the Imperial Conservatoire des Arts-et-Metiers more particularly destined to be used for comparisons with the standards made by or for the different governments which may adopt the metric system, and it was found that the difference was very infinitesimal, and that the condition of the standards gave every possible guarantee of exactitude.

Upon the subject of coinage much greater difficulty was experienced, and after considerable discussion, in which the Austrian delegate, Baron de Hock, the American Commissioners, Mr. Ruggles and Mr. Kennedy, took a leading part, the committee submitted to the conference the following distinct propositions:—

1. The first condition to be fulfilled is the adoption, by the different governments interested in this question, of the same units in the issue of their gold coins.

2. It is desirable that such coins be everywhere coined nine-tenths fine.

3. It is desirable that each state should introduce among its gold coins one piece at least of a value equal to that of one of the pieces in use among the other states

interested, so that there may be among all the systems a point of common contact. From that each nation will afterwards endeavour to assimilate gradually its system of coinage to that which may be chosen as a uniform basis.

4. The series of gold coins now in use in France, being adopted by a great part of the population of Europe, is recommended as a basis of the uniform system.

5. Whereas, in consequence of accidental and happy circumstances, the most important monetary units may be adapted to the French gold piece of five-francs, by means of very small changes, this piece seems the most convenient to serve as a basis of a monetary system, and the coins issued upon such a basis may become, as soon as the convenience of the nations will permit, multiples of this unit.

6. It is desirable that the different governments should decide that the coins issued by each nation, in conformity with the uniform system proposed and agreed, should bear legal currency in all their countries.

7. It is extremely desirable that the system of double standards be abandoned wherever it yet exists.

8. It is extremely desirable that the system of decimal numeration be universally adopted, and that the money of all nations should be of the same fineness and of the same form.

9. It is desirable that the governments should come to an understanding for adopting common measures of control, so as to guarantee the integrity of the coinage both when issued and whilst in circulation.

It will be observed that these propositions laid down no specific scheme of universal coinage. They took gold coins for their basis because most nations had already adopted it as the sole standard. Mr. Ruggles stated that between 1851 and 1865 the United States, France, and Great Britain issued collectively, in round numbers, £420,000,000 in gold coins to £24,000,000 in silver coins. The Congress adopted the fineness of one to ten as already extensively in use. It simply aimed at one point of accord in the different systems of coinage, in having one piece at least alike everywhere; and fixed upon the five-franc piece in gold as on the whole the most convenient for the basis of the uniform system.

It is quite possible that were we to start a new system, irrespective altogether of the existing conditions, a better and a more scientific plan might yet be suggested, but the conference had a practical object in view, and we had to consider not what might be theoretically the most perfect, but what under present circumstances could best be attempted. When, therefore, M. Michel Chevalier proposed a totally new system—to take a piece of five grammes of gold, nine-tenths fine, as the universal monetary unit—it was felt that, whatever might be its merits, it would be impossible to disregard the immense amount of coinage of silver and gold now in existence, which would require to be altogether withdrawn. The new coin suggested would agree with no existing coinage, and therefore its introduction would be quite impracticable. For my part I objected to taking the piece of five francs in gold as a unit, it being too small and too easily lost. I proposed to substitute for it the ten-franc piece, but it was agreed that the word “unit” attached to the five francs, as at first inserted in the 8th proposition, should be omitted; and the proposition as adopted simply laid down that value as a basis of calculation, the different nations being quite at liberty to choose for their unit any multiple of the same, say 10, 20, or 25 francs. M. Wolowski, so able and so eloquent, fought hard in favour of the double standard. He argued in favour of leaving it optional with debtors to pay in gold or silver, and thought it inexpedient to fix on the gold standard for all nations, having regard to the changes which have occurred and may still occur in the production of gold and silver. M. Wolowski was, of course, answered that the system of a double standard was unjust in itself, since it left the creditor at the mercy of the debtor, in allowing him to pay in the least valu-

able metal; that if it was desirable that the standard of exchange should be as little as possible subject to oscillation of value, it was certainly inexpedient to subject it to the oscillations affecting both gold and silver; whilst the adoption of a double standard would render any agreement with England and America impossible. Thus the discussion ended, and the resolutions proposed passed almost unanimously, with some verbal alterations.

As regards areometry, the conference, in terms of the report prepared by M. De Baumauer, resolved that, for international transactions concerning liquids, the same system of areometrical gradations be employed in all countries. It is desirable that the special scales employed for different liquids be decimal, and based either on demilitres or specific volumes. The conference expressed the wish that the centigrade thermometer, as well as the metric scale of the barometer, be generally adopted.

We must now turn our attention to the Diplomatic Conference, which was held about the same time at the Foreign-office, especially about international coinage.

I have already stated that France, Italy, Belgium, and Switzerland, towards the end of 1865, concluded among themselves a monetary treaty, the negotiation of which is greatly due to M. de Parieu, Vice-President of the Council of State, and Member of the Institute. And it was with the view of extending the provisions of that treaty to other countries that the Diplomatic Conference was summoned. The two conferences differed essentially in their constitution, though their ultimate object in reality was one and the same. The Diplomatic Conference was attended by official delegates nominated by the different governments, and having first been presided over by M. Moustier, the Minister for Foreign Affairs, and then by M. de Parieu, was afterwards, by decree of the Emperor, placed under the presidency of His Imperial Highness Prince Napoleon. The conference was opened on the 17th of June, and ended on the 6th of July, 1867; and, instead of having any resolutions previously prepared by a committee, the conference first agreed upon a *questionnaire*, or a series of points to be discussed, and then entered deliberately on the questions embraced, each member speaking and voting affirmatively or negatively on the alternative submitted. The first question was, What is the best means to realize the uniform system of money? Is it by the creation of a system altogether new, independent of the existing systems, and, in that case, what should be the basis of that system; or, by a mutual co-ordination of the existing systems, having regard to the scientific advantages of certain types and to the number of persons who have adopted them; and, in that case, which monetary system should be principally taken into account, subject to any improvement of which it may be capable? Here, too, as in the other conference, some members, especially from Belgium, expressed a preference for a system entirely new, but, after some discussion, the congress voted unanimously in favour of the second alternative, adding that the system agreed upon by the Monetary Convention of 1865 should be the one principally to be taken under consideration.

The next question referred to the standard, and having regard to the decided advance made everywhere towards the adoption of a gold standard, it was unanimously resolved, with the exception of the representatives of the Netherlands, "That it is not possible to attain the desired uniformity, or even a partial coincidence, on the basis and on condition of the exclusive adoption of a silver standard, but that it is possible to attain it on the basis of a gold standard, allowing each state to preserve the silver standard in a transitory manner. The latter condition being necessary for states such as Prussia, Sweden, and the Netherlands, where the silver standard alone is still maintained." Then a resolution was added supported by all the representatives except those of Prussia and the Netherlands, "That the advantage of

internationality which the coinage taken for common standard would possess, is not itself a sufficient guarantee for its being maintained in circulation in all the states, but it is necessary to stipulate that, in the countries which continue to use the silver standard only, and in those which have a double standard, the relation between gold and silver should not be established on too low a footing, in order to give due facility for the practical introduction of the gold coinage." It appears that at present the relation of gold to silver in Prussia is 1 to 15.45, in Spain as 1 to 15.48, in France as 1 to 15.50, and in the United States as 1 to 16, about.

The congress then entered on the difficult question of the common denominator, and, having first unanimously agreed that, for the success of the monetary unification it is necessary to fix types having a common denominator for the weight of the gold coin, with an identical fineness of $\frac{9}{10}$ fine, it was decided by a majority of 13 against 2, the representatives of England and Sweden having voted against, and those of Russia, Bavaria, Baden, Wurtemberg, and Belgium having abstained from voting, "That the common denomination should be the piece of 5 francs." Though many members spoke in favour of the reduction of the dollar to 5 francs, and of the pound sterling to 25 francs, M. Wallenberg, the delegate from Sweden, preferred the 10 francs in gold; and M. de Parieu himself said that that piece would be specially convenient to France, since she would only require to change the place of the comma to express the new unit, whilst, moreover, the piece of 10 francs, under the name of ducat, a piece of about the same value, had once a universal circulation.

As regards the reduction of the pound to 25 francs, Prof. Graham, the master of the Mint, stated that even if it was true that the difference of 20 centimes was included within the limits of tolerance, it is, nevertheless, a fact that the English Government considers itself bound in honour not to take advantage of it. There would, therefore, be much inconvenience in having in circulation sovereigns of 25.20 should the issue of new sovereigns reduced to 25 francs be resolved upon, and a re-coinage would be necessary. In his opinion, if the piece of 10 francs were adopted, it would have an advantage over the piece of five francs. It was then agreed by all, except the representatives of Prussia, Baden, and Wurtemberg, who abstained from voting, "That it would be useful that the types of coinage determined by the Monetary Convention of the 23rd December, 1865, should be, in the interest of unification, and, consequently, of reciprocity, completed by new types, as per example of 25 francs." But when the proposal was made that a piece of fifteen francs be also added, the representatives of only seven countries voted in favour of it, those of seven countries voted against it, and those of six, including Great Britain, abstained from voting. It was then unanimously agreed that the measures which may be adopted by the governments of the different states in order to modify their respective monetary systems, in accordance with the basis indicated by the conference, should be made as much as possible the subject of diplomatic conventions. That soon after the reception of the answers which may be given by the different states to the official communication which will be made to them of the labours of the conference by the French Government, that government may, if necessary, call another conference. But as to the time by which such answer should be given, the representatives of ten countries voted that it be given before the first of February next; those of five voted that it be given before the first of October, 1867; those of the United States voted for the 15th of May, 1868; and those of Great Britain for the first of June, 1868; the representatives of France and Spain having abstained from voting. In substance, the resolutions of both conferences perfectly agree, the principal recommendation consisting in taking advantage of the particular position in which

the five-franc piece stands towards the dollar on the one hand, and the pound sterling.

It now remains for me to consider the position in which this country is placed in relation to these two conferences. Officially, I may say the United Kingdom is in no way pledged by their resolution, the government having maintained itself almost altogether passive as regards the one and the other. The conference of the Palais de l'Industrie owed its origination to the Metric Committee of the British Association and the British branch of the International Association; and in the International Committee no official member was deputed by Her Majesty's Government, though the British Commission was nominally, at least, represented in it. At the Diplomatic Conference, the Master of the Mint and Mr. Rivers Wilson, though officially deputed, were expressly precluded from in any way binding this country to any course. Nevertheless, it is vain to imagine that this country can remain indifferent to what is passing in all the rest of the world; and it would be far better for her to place herself, by a spontaneous and generous policy, at the head of those measures which tend to improvements in human society, than to lag behind till necessity and self-interest compel her to accept what is already irrevocably settled. The measures advocated by these conferences affect on the one hand our entire system of weights and measures, and on the other the basis of our coinage and our entire system of accountancy. As regards weights and measures, the only course left is the early introduction of the metric system, pure and simple, as it exists in the greater part of Europe, and in different States of America. The Act of 1864, which renders the use of it permissive in this country, is manifestly imperfect. It is simply of a negative character, removing the previous illegality. It does not provide for standards, and it is a question whether any one could actually use the metric weights and measures, since they cannot be stamped. What is wanted is a more definite measure, preparing the way for the early substitution of the metric system, for the present uncouth, complicated, and conflicting practice. In other countries the law provided that after three, five, or ten years' time, for preparation, it should become compulsory; and I am satisfied a similar method must be adopted in this country, if we wish the reform to be introduced in our time at least. Meanwhile, the introduction of the system should certainly be encouraged in all the schools, and demanded in all schools receiving grants from the Privy Council; and an examination in the same should also be required of teachers in the Normal Schools, and candidates for Government certificates. Let us hope that during the next session of Parliament some measures may be introduced for bringing this important object to some practical issue.

As regards coins, the proceedings of the conference have greatly simplified the question by leaving us the only alternative as to the mode of adapting either the gold piece of five francs, or any of its multiples, to British coinage. To my mind, a gold unit of five francs, or 4s. 2d., is decidedly too low; the choice lies between reducing the sovereign to 25 francs or taking the 10 francs as a new unit. The reduction of the sovereign to 25 francs is connected with the following difficulties. The difference between 25 francs and 25·20 francs may appear small, yet it cannot be ignored in making that arrangement. It will not do to say that many sovereigns now circulate under weight. The Government does not recognise it; nor could we declare that to be 25 francs which is in effect 25·20 francs. A new coinage would be necessary, and in that case either we should have in circulation two kinds of sovereigns, differing very slightly in value, or we should need to have resort to the issue of a pound note to assist the withdrawal of the large number of sovereigns now in circulation. With the sovereign as a unit there would never be an easy analogy between ours and the one lead-

ing system prevalent in almost every other European country. With a unit so large, requiring three decimal fractions in all accounts, the best advantages of the decimal system, viz., the brevity and saving of time, are practically lost. Lastly, not to mention more difficulties and objections, the counting of every sum less than a pound by mils seems to me exceedingly awkward and complicated. The main advantage ever adduced in favour of retaining the pound as a unit is that it is universally known in the trading and banking circles of the world, that it is associated in this country with every calculation of value, and that it is a well-defined and invariable value. But if all European and American countries enter the convention on the terms of the conference, the pound will be the coin least known in Europe. There would doubtless be much inconvenience in changing the unit of value, but the difficulty is greatly exaggerated. And as for the invariability in the value of the sovereign, the same will apply to any coin which may be legally declared by this country as the unit of accounts. These are some of the many obstacles to our adopting the plan of reducing the pound to 25 francs, and making that the unit of a decimal system for this country. But there is another plan, which appears to be far preferable, viz., the taking of the gold piece of ten francs, equivalent to 100 pence of present money, as a unit. The present penny is practically the same in value as the ten centimes. Let a gold piece representing one hundred pence, which might be called a ducat, be issued and coined of the exact value of ten francs. Let this coin for a time be put in circulation as a token only, or as a coin of convenience, in which manner it would make no difference if its real value be slightly inferior to its nominal value, and let every encouragement be given to use this hundred-pence piece as a unit. Should it prove popular and convenient, a ten-pence piece might also be issued, to take eventually the place of the present shilling; and when the time comes for the ultimate declaration of the ducat as the unit of value, the exact relation of the same to the sovereign would be fixed, and the difference between the sovereign and the ducat would be duly allowed in exchange.

The convenience of this method is very decided. It would be strictly decimal. It would be plain and simple for computation. In a ten-ducat piece, equivalent to one hundred francs, we should have an excellent coin of accounts for large transactions, as in the tenth of a penny we might, if required, have a coin adapted to the most minute business of life; and, above all, it would place us on an exact level with the system likely to be universal, it being a fact that already 100 millions of people have accepted it, and probably 100 millions more will adhere to it almost immediately.

I do not wish to be dogmatic in propounding such a plan. I only suggest it for serious consideration, and I am certainly encouraged in thinking that it does in a great measure accord with many of the most valuable suggestions made to this Society some ten years ago. In the preference thus given to the ten francs rather than to the 25 francs, I speak my own mind only, the Metric Committee of the British Association and the Council of the International Association having come to no resolution on the subject. I am strongly convinced, however, that the scheme is not only sound and practical, but the only one likely to prove in the end successful and permanent. The time has come when some decisive measure must be taken, Her Majesty's Government having to give answer on the subject at least not later than June next. The action of the Government will probably be either to move for a Committee of the House of Commons or to nominate a Royal Commission to consider the question. Whatever method may be preferred, let us hope that the inquiry will be instituted in a liberal spirit, and with an intention to come to practical and final conclusions. As His Imperial Highness Prince Napoleon said to the conference, "Let us keep always before our eyes the

Object at which we aim. Let us think that the public expects a result from our conference, and let us endeavour to remove the objection that commissions and conferences always remain sterile of results. We should see that our meetings should not end in an able report, and in a barren pleading for the cause of unity; but, that they aim to realise a practical result."

In laying this important subject before the Society, I know I speak to men who, while alive to all the difficulties which necessarily surround every social reform, are not easily deterred by them from advocating or promoting what they deem to be a useful and substantial improvement. The moment is most opportune for removing one more of those barriers which hinder and arrest international intercourse. Shall England refuse to lend her helping hand? Her influence is enormous. At her bidding are upwards of one hundred millions of people. Will she resist the tide of social progress? There was a time when, surrounded by the stormy deep, she deemed herself independent of what was passing in other countries. But she now feels that she belongs to the great European family, and that she is bound up with the social and political interests of other states. To stand aside, when all other nations are intent upon a reform of so practical a character as the one now advocated, would be derogatory to her position. Whatever be her power and influence in the commercial and monetary world, England must remember that the world is marching onward in the path of progress, that *Eppur si muove* is the motto engraven on every object in the world of matter and mind, and that her highest and noblest prerogative is and will ever be to place herself at the head of all measures which tend to advance the interests of civilisation and science throughout the world.

DISCUSSION.

Mr. F. HENDRIKS said it was either his misfortune or obtuseness not to be able to appreciate his friend Professor Levi's paper, with the exception of the exordium and the peroration, quite as much as some persons present would no doubt appreciate it. He had the misfortune to differ from almost every one of Prof. Levi's conclusions. It seemed to him (Mr. Hendriks) that a good deal of prominence had been given to the resolutions of the Royal Commissioners on the decimal question, more, he thought, than they were entitled to. That Royal Commission was composed of only three gentlemen, one of whom, from age or some other circumstances, thought fit to retire; another was a banker, who stated, at a meeting held some time previously, that he had made his money under the old system, and was, therefore, not peculiarly biassed in its favour; and the third was a member of Parliament, who saw nothing further in favour of the decimal system of coinage than that it might be very convenient to inexperienced travellers on the Continent. He submitted the conclusions, arrived at under such circumstances, were not of great importance. He contrasted with them the resolutions which were come to by a commission which recently sat in Austria with reference to the projected change. That commission was composed of twenty-two gentlemen drawn from all classes of the community, and all of those persons were well qualified to deal with the subject referred to them. That commission unanimously resolved in favour of joining the convention referred to by Prof. Levi, and adopting the 25-franc piece as the unit. France was about to issue a 25-franc piece, and he believed this coin would be the future international pound sterling. He felt certain, notwithstanding the favour with which the 10-franc piece was regarded by Professor Levi, the pound sterling, associated as it was with the commercial transactions of a thousand years; current as it was in all our colonies; current as it was by several foreign countries having adopted it,—Portugal amongst others; speaking, as it did, a universal language

throughout the world, it would ultimately become the monetary unit. With regard to the conference which had lately been sitting on this subject, he took exception to the term "diplomatic" given to it by Professor Levi. He (Mr. Hendriks) was not aware that any member of that conference held any diplomatic status, except the representative of the Turkish Government, who was selected solely for his special knowledge of the subject. It was a conference invited by the French Government, the members of which were to be nominated by some twenty states. He did not agree with the learned professor in thinking that the 5-franc piece was in any way recommended by that conference, because in their resolution they spoke of the 5-franc piece as a common denominator of the coins of the convention. If they took a survey of the chief coins of the European nations, they would be found to be multiples of 5 francs. Thus, from the following table it would be seen that in England the pound sterling would be a multiple of 5 francs; and the same would be the case in the other countries:—

| States. | Unit. | Present value. | New value. |
|--------------------------|----------------------------|-------------------|------------|
| | | fr. c. | f. |
| England | Pound sterling | 25 22 | 25 |
| Austria | Florin | 2 47 | 2½ |
| Spain | Doubloon of Isabella | 26 0 | 25 |
| France | Franc | 1 0 | 1 |
| Frankfort-on-Maine. | Florin | 2 12 | 2 |
| Greece | Drachma | 0 90 | 1 |
| Holland | Florin | 2 25 | 2½ |
| Portugal | Mille Reis | 5 09 | 5 |
| Prussia | Thaler | 3 70 | 5 (3½) |
| Russia | Rouble | 4 0 | 4 |
| Sweden and Norway | Ricks daler | 5 66 | 5 |
| United States | Dollar | 5 18 | 5 |
| Turkey | Pound Turkish | 22 57 | 25 |
| India | Rupee | 2 45 | 2½ |
| Persia | Thoman | 11 87 to 12 90 | 12½ |
| Japan | Itzebu | 2 50 | idem. |

Now, he could not conceive any proposition which could less approve itself to a practical set of men like Englishmen, than to have a coinage of a 10-franc piece. It was notorious to those who had given attention to monetary matters that the wear and tear of small coins was greater and more costly than that of larger coins; and he thought the learned professor had confused what he recommended as a coin of account with a coin of circulation. In England, the pound sterling had the advantage of a unit, convenient both for circulation and account; and he could assure the meeting, from some knowledge of the subject, that this country was envied in the possession of this unit by most foreign nations. All they had to do, to bring the pound sterling into strict union with this convention, was to reduce the weight of gold in the sovereign to the extent of 932 thousandths of a grain. It might seem an infraction of public faith to reduce the weight of our coinage in any degree, but the amount was so small that he considered the effect would be inappreciable. We might take examples from other countries—countries quite as anxious as ourselves in keeping faith with the national credit; as Holland, who had never been accused of breaking faith, in 1861 made a difference of far greater amount without giving rise to any practical inconvenience. The difference there made was three times as great as that which would be required in this country. In America—and no one would accuse that country of any desire to repudiate its obligations—public men were very ready to advocate measures for the reduction of the value of the gold dollar by nearly four times the amount which was required in this country in the case of the sovereign, and yet we could not regard America as a country nationally advocating repudiation. And, again, we found the coin circulating in this country was reduced by wear and tear nearly to the value of the 25-franc piece. Mr. Hendriks noticed that Prof. Graham

stated that the ordinary wear and tear was not so great as to bring it exactly to the 25-franc piece, but there was no precise information before the public on that point. He had tried in vain to get information from the Bank of England as to the actual wear and tear of the coin in circulation. Their opinion was scarcely reliable, inasmuch as it was derived from a partial and incomplete experience. It was well known that if light coin was taken to the Bank it would be at once separated from that of full weight, and at once defaced. With this knowledge, no one intentionally took light coin to the Bank of England. It was taken to the joint-stock and private banks, and thus kept in circulation; and thus millions of coins were constantly circulating in the country which were of much lighter character than the experience of the Bank of England would admit, and, in his opinion, depreciated to an extent which would assimilate them to the proposed coin of the convention. In fact, there was a degree of "tolerance" allowed at the Mint which persons were scarcely aware of. Persons might think they got the exact number of grains of gold, but that was not so. They might think in a thousand sovereigns they got the full amount of gold, but in reality they only got the value of £993 and a fraction. Even assuming the current coin was a little above the value of the 25-franc piece, that would enable the government to carry out the new coinage of the 25-francs with facility. With regard to the injustice to the present holders of money, he thought the effect would be infinitesimal. Every man was a debtor as well as a creditor. If he was a greater debtor than creditor, it would be to his advantage to pay in light coin. He hoped he should not be understood as in any way advocating the debasement of our coin; but when there was a great national object to be effected—with our 30 millions of population in England, our 10 millions in our colonies, and our 130 millions in India, and having advanced posts of civilization in all parts of the world, it was desirable that we should be enabled to join in the convention, which already included in its numbers 100 millions of people; and he thought that we might fairly make some small sacrifice to enable us to do so. It might be asked why should not the representatives at the convention have agreed to adopt our coinage as the standard unit? the answer was they have probably half as much again of gold coin in circulation as we have; for during the last sixteen years, since the discovery of Californian and Australian gold, the coinage of foreign gold pieces had increased to the extent of upwards of \$120,000,000 sterling; and gold had, to a great extent, taken the place of silver in continental currency. We ought not, he submitted, to object to alter our system a little to meet the foreign views of the subject. The nations which formerly coined silver in the proportion of 15½ to 1, were now reducing the relative proportion between their gold and silver coinage, and, following the example of England, were making silver coins mere tokens. He thought there were solid grounds for adhering to the pound sterling as the system for the future. With regard to the metrical system of weights and measures, that was no doubt a subject of equal importance with coinage; but that was not quite the question of the evening. The real question was the practical means by which this country might join in this international convention. All the other great nations were joining in it, and we should be in the ungraceful position of being the last to enter it. He had in his possession the model, from the French mint, of the intended new 25-franc piece, which was exactly 24 millimètres in diameter, and this would meet the metrical system. He could not understand why the friends of the metrical system saw anything in the 25-franc piece more antagonistic to that system generally than they did in the 20-franc, the 10-franc, and the 1-franc system. He begged to point out that the 10-franc piece, advocated by Professor Levi, would

simply be an impossibility for the people of this country to understand. They might understand the Napoleon or the franc as the unit; and they did understand the pound sterling. He had that afternoon endeavoured to reduce to the shortest rule the method by which the 10-franc piece could be converted into pounds sterling, and *vice versa*; but he thought it would be extremely difficult for the public generally to adopt. The 10-franc piece = 8 shillings = £0.4 or ½ = 4 florins. Therefore, to convert the pound sterling and its sub-divisions into 10-franc pieces, those who are unacquainted with decimals must first divide by 5, and then multiply by 2, or else, if acquainted with decimals, they must multiply by .4, after converting the sub-divisions of the pound into decimal fractions; and *vice versa*, as £1 is equal to 25 francs, or 2½ 10-fr. pieces, therefore, to convert the 10-franc piece and its sub-divisions into pounds sterling, those who are unacquainted with decimals must divide the number of 10-franc pieces by 2½, which they can only accomplish by multiplying by 2, and then dividing by 5, or else, if acquainted with decimals, they must divide the 10-franc piece and its sub-divisions decimally, stated by 2.5. He thought the use of the 10-franc piece, as proposed by Professor Levi, was beset with such difficulties as to render its adoption all but impossible.

Mr. FELLOWS remarked that he was in the unhappy condition of disagreeing both with the learned professor who had read the paper, and also to some extent with the last speaker. The former gentleman had overlooked one or two important points with regard to the introduction of the decimal system of coinage in this country. He had assumed that there would not be the same difference between the English new ducat and the French coinage that there would be between the new sovereign and the existing 25 francs. But there would, in fact, be exactly the same difference. It would be this—if the new ducat were exactly 100 pence, of course it would be as 100 was to 240; so that 240 new ducats would be equal to 100 sovereigns. "We should have to make an alteration of 2d. in the pound to bring our present sovereign to be equal with the 25 francs, and we should have to make the same proportionate alteration in the 100 pence. Therefore, the difficulty with regard to making the system international was equal both in Professor Levi's system and in that of Mr. Hendriks.

Professor LEVI said there were two operations suggested in his plan. At first let the 100d. be a subsidiary coin, and when the time came to make the difference the twopence could easily be allowed for.

Mr. FELLOWS—Then Professor Levi proposed that the new ducat should pass as 100d., which would only be worth 99d. [Professor LEVI—As a subsidiary coin.] It would appear to have one value, but it was really another value. He could not understand a course more opposed to true monetary principles than that Professor Levi argued for. If it was to be simply regarded as a token it was a different thing, then there was no necessity for making it exactly equal to the French ten francs, as our penny was merely a token. He conceived Prof. Levi had made another mistake in saying that the penny was equal to 10 centimes. There was the same proportional difference between the 10 centimes and the penny as there was between the present sovereign and the proposed new sovereign; but it must be remembered all the copper coins were tokens. The penny represented the 240th part of a pound; it was the same as a note. The £5 bank-note represented the value of five golden sovereigns, and all the other coins were merely tokens in connection with it. Passing from that subject, he thought they could not well consider this question without dividing it into two parts; there was the question of decimalization and the question of making it international. It was as easy to make the pound sterling international, as it was to make the learned professor's unit international. There would be the same change required with the one as with the other, and it was

the same with the dollar. If we coined a piece equal to 100 half-pennies, we could have the dollar, or five-shilling piece. There would be the same proportion of alteration in Prof. Levi's as in Mr. Hendriks' principle. With regard to decimalization, he thought the principle to be adopted was to begin with the smallest coin, which practice had shown to be the least necessary for practical use, and below which we ought not to go. The farthing in this country had been found the least practical coin of England, and as such entered into accounts, as well as into the prices of various articles. It did not follow because we went no lower than the farthing it was not wise to do so in other countries. Each country must choose for itself. He thought Mr. Hendriks' remarks showed that the sovereign was about the right value for the highest coin, and the great popularity of that coin abroad was because it so nearly coincided with definite proportions of existing coins, and was of convenient size for ordinary transactions. In decimalizing, he maintained that the French and American system, and all those which he was acquainted with, had started at the wrong end. They had placed the cart before the horse. He submitted we ought to treat our coin, weights and measures as we do our numeration—begin with the lowest and increase by tens upwards. It was wrong to call the hundredth of a dollar a cent. So with the pound and mil system, it was wrong, to begin with the pound. We should take the farthing, then a coin of ten farthings, and then 100 farthings, and then 1,000 farthings, to represent the pound, and so with the French and American coinage. In addition to the difficulties inherent to any change of this kind, there was imposed, he said, the difficulty of reorganising the whole of the Post-office, Customs, and Excise transactions of the country, which would lead to interminable disputes, from the introduction of the pound and mil, instead of the farthing, and with regard to all printed prices throughout the country the same alteration would occur; but beginning with the farthing, and having a coin which we could use, it could be employed in all transactions of trade, and they could mete it decimally, or in pounds, shillings, and pence. That was the system he proposed; and it might be made international. To begin with the pound, and go down to the farthing, he considered was wrong, as also going so low as the half-farthing. He concluded by expressing his obligations to Professor Levi for the able manner in which he had brought this subject before the meeting.

Judge MANOCKJEE CURSETJEE said the gentleman who last addressed them had found equal fault with the theories proposed by Professor Levi and Mr. Hendrik. He was not himself going to find fault with the one or the other. He was not able to penetrate into the depth of the several questions so ably urged, for the best of all reasons, that he had not paid a sufficient amount of attention to the subject before them. But there was one matter in connection with it on which he might be permitted to say a very few words. A great deal had been said with regard to the wants of this country, but, to his surprise, the only sentence which had been dropped with respect to India was that in which the first speaker mentioned, as it were, incidentally, that in our Indian dependencies there were 130 millions of the Queen's subjects who were interested in this question; he was right in saying it was nearer 200 millions than 130 millions throughout British India. The requirements of that vast mass of the population had not been touched upon this evening further than in that passing allusion. It was a subject which ought to go home to every heart, because India was an integral part of the British empire. Its bulwark! The difficulty of carrying out any new measure of this kind might be great in this country, but in India it was different. The government had only to determine to carry out a thing, and issue a *Hookum*, and it was forthwith done, and the *Hookum* went round from one part of

the country to the other to be respected. They had in India a very complicated monetary system indeed. In this country the proper weight and the intrinsic value of the coin in circulation were known by one appellation—pound sterling—but in India, that which was called the rupee—the standard of currency there—differed in weight and value as every few hundred miles one travelled up or down the country. The rupee of Bombay was of different value to the rupee of Surat, whilst the latter differed again from that of Hyderabad, and so on. At one period they had gold coins in India which were now only matters of history. Formerly there were what were called gold rupees, which were about the size of a green pea, and one could hold from 700 to 1,000 of them in the palm of the hand, but they had all gone out of use. The subject of the introduction of gold coin into India had been under discussion for the last two or three years, and had been under the consideration of the Government, and at the council presided over by Sir W. Mansfield, who had taken up the question in a most masterly manner, resolutions were passed, which he begged to read to the meeting, as he thought they would be listened to with interest. They were as follows:—

"With respect to the introduction of gold, the following points seem to be generally and firmly established:—

"1st. That gold coins of various descriptions of mohurs and sovereigns, English and Australian, although not used as money by the state, are generally at par, or above par in price, whether in the presidency, towns, or in the cities of the Mofussil.

"2nd. That they are sought for in the provinces for trading purposes by merchants and bankers, and as a medium of a reserve of wealth by the people at large.

"3rd. That when gold is below par in price, it happens either because gold is almost practically unknown in the district concerned, or because the people are too poor to create a demand for it.

"4th. That the demand for gold currency is unanimous throughout the country.

"5th. That gold coins of 15, 10, and 5 rupees respectively would find more favour in the eyes of the people than notes of like value.

"6th. That the introduction of gold would facilitate the establishment of the currency notes, outlying treasuries being assisted by such a measure towards the convertibility of the notes; and

"7th. That the opinion is general, almost unanimous, that the currency should consist of gold, silver, and paper."

He would, in conclusion, throw out a suggestion, that in all their conferences or congresses on this subject they should have some gentlemen who had experience of the wants and requirements of India added to the list of members.

Mr. BROWN said the question was divided into two parts—first, that of weights and measures, and, secondly, that of money. They were all pretty well agreed that very great advantage would result if the change proposed were of an international character. Hitherto they had never been able to find a system so perfect in itself as the metrical system. At all meetings he had attended unanimous resolutions were passed in favour of that system. At present the metrical system was legal in this country only by voluntary adoption, but no good would come of it till it was made compulsory. He hoped there would be a full discussion of this subject in the House of Commons in the present session, and that a period would be definitely fixed at which the system should come into operation, whatever the number of years might be, and he hoped some pressure would be brought to bear upon the Government on the subject. The question of money, however, divided itself into two parts—viz., whether we were to adopt a national system of decimal coinage or an international one? For many years he was an advocate for the pound sterling divided into a thousand parts, but when he looked at it in an international point of view, he saw so much trouble in converting our pound sterling into an international pound sterling, that he was inclined to adopt the metrical system already adopted by so many millions of people. They could not ask those nations which have coined 200 or 300 millions of money to abandon it because we have made the pound sterling our unit. We must rather consider how we can alter our pound sterling to make it correspond with the 25 francs of the French. Whether or

adopt a new coin or alter the pound sterling, it must equally be the unit. The new pound sterling would be a pound of twopence less value, or equal to the 25-franc piece; whereas if we took the 10-franc piece as the unit, and multiplied that by ten, we should have the same figures in all our accounts, and it could be read both as English and French money. With regard to the issue of the 25-franc piece in gold, he saw no objection to it, but the question was on what terms it should be issued to express a value. If the unit was 10 francs, and if we had a unit of gold to represent that 10 francs, we might have 20-franc and 30-franc pieces. Having a 10-franc piece as a unit, the next higher unit beyond that would be 100-franc piece, and the expression of a 100-franc piece, by giving a name to it, would be very convenient. In large transactions in financial matters, we wanted the aid of numbers greater than those we have experienced hitherto. He believed the 100 francs would be a more convenient unit than the pound sterling. That would leave the franc as it was now called; we should have the 10-franc piece, and accounts would be brought into decimals by the alteration of one place in the decimal point. From that consideration mainly he had given up the advocacy of the division of the pound sterling into mils, and it would be introducing a very useful coin, the 10-franc piece, divided into 100 pence, as they now existed. If we altered the pound sterling to the 25-franc piece, no one would think of recoining the whole of our silver and copper money because of that small difference in value; and, therefore, the 100 pence, as now coined, would pass as an equivalent to the new coin of 10 francs, and as definite proportions of the new coin of 25 francs. He hoped to see, as he believed he should, the metrical system gain ground in this country, as being the most satisfactory basis on which the coinage and measures of this country could be placed.

Signor PAGLIARDINI remarked that all who had spoken on this subject were in favour of a change in the present system; and all the objection he had heard to the different systems propounded was that change must be necessarily accompanied by alteration. The gentlemen, however, who stood out for the pound and mils system forgot one thing, viz., to make it interchangeable; all they did was to make it decimal. They all admitted the value of one international coin, viz., the franc, hence it was impossible that the English pound sterling could be admitted as the universal coin. It must be the franc, for the defenders of the pound sterling, or the ducat, or the florin, were obliged to found those coins upon their several proportions to the franc, except Mr. Fellows, who stood upon the farthing. But the objection to the farthing was that it was not international. [Mr. FELLOWS said it could be made so as easily as any other unit.] He submitted that the franc was too low a unit for the expression of large figures. The French figures were obscure when applied to the commerce or statistics of the country. If England had started in this matter fifty or sixty years ago, we might have had the pound sterling divided decimally, but we were too late now to come forward with our pound sterling, because it would not fit into any one European system. He would say the only logical way of dealing with this question was, if they went for the decimal system, to go for it frankly and stand by it. He supported the proposition for a 10-franc piece, by whatever name it might be called; and it was for all the nations joining in the convention to say that henceforth the gold coin of 9s. 10d. standard should be an international coin, and then all other money might come in as tokens.

Mr. POLLARD URQUHART remarked that in all discussions of this subject it was assumed that a change of the unit of account implied a change of the unit of coin; and it was further assumed that such a change would put us to a little inconvenience. He did not himself regard the diminution in the value of coin as a matter so trivial as those who preceded him seemed to

think it. He must say he regarded with great apprehension even the appearance of lowering the standard of our coin. He believed our good name had been of great benefit to us in the extension of our commercial and financial transactions in every part of the world; and he believed the national credit would suffer, and that we should sacrifice our good name amongst the nations of Europe if we gave even the appearance of diminishing our standard. The standard of our money was restored in the year 1819. The return to cash payments did not produce any great amount of distress, but we had received great benefits in return for it. He believed it had been the means of enabling us to lower the interest on the public debt to a far greater proportion than the addition that was made to it by the return to cash payments; and the system had resulted in bringing to this country a larger amount of financial operations, from all parts of the globe, than could have been produced in any other way. We had had the pound sterling as a unit of account for a very long time, but only as a gold coin for the last 40 or 50 years. There was formerly one unit of account, but no coin to represent it, and he was not aware that any great inconvenience resulted from that state of things. We had better submit to any temporary inconvenience than give the appearance of want of national faith with the nations of Europe.

The CHAIRMAN, in proposing a vote of thanks to Professor Levi, would briefly express one or two opinions on this subject. He thought, with respect to the pound sterling, the shilling, the sixpence, the penny, and the halfpenny, a great deal of the prejudice which existed in their favour was the result of education. What we were brought up to in youth we kept to in old age. He began and continued a commercial life for many years in France, and of course he was drilled into the decimal system, and though he had been engaged in commercial operations in the British dominions for many years since, he found a difficulty in his calculations in pounds, shillings, and pence, because they were so intricate in comparison with the French system. At the same time, he admitted the force of what had been said with regard to the French system in matters of large accounts and statistics. He also admitted that there might be great difficulty in getting the English people of the present generation to comprehend that system thoroughly; and some could probably never be made to do so; but we were not now so isolated as we formerly were. Europe was becoming as one nation, and was so closely connected together in business transactions, that it was desirable, if possible, to effect a change which would enable our transactions to be carried on with the utmost facility. He believed this might be brought about by the system being regularly taught in our schools. In the course of a few years we should think as well in the metrical system, or whatever system was chosen, as we did now in the pound sterling. If we were brought up to think in ten-franc pieces, or in any other pieces that were found more convenient for all nations—not for England alone—it would soon become as convenient to us as the pound sterling. We were in the grub state at present; we wanted to become a butterfly, but had to get through the chrysalis state. He concluded by proposing a vote of thanks to Professor Levi for his very able paper.

The vote of thanks having been passed,

Professor LEVI said he was very grateful to the meeting for the patient attention that had been given to a subject so dry. He hoped after this discussion there would be no great difficulty in promoting a measure which, he was certain, would be of the greatest benefit to the world at large.

The Secretary has received the following communication:—

SIR,—There is little, if any, room for doubt that, accustomed as India has been for so many ages to a

silver currency, the Government will adopt the double standard at first as matter of temporary expediency. But there is no reason to suppose that the ultimate results in India will be different from those experienced in other parts of the world. The continuous new supplies of gold will demonetize silver, and India will at length be obliged to coin its silver money in a debased or token form. The relative value of Indian and English money is subject to the fluctuations of the money market. A rupee may sometimes be worth two shillings and two-pence, at other times only one shilling and ninepence, but two shillings is the average par or medium commercial value. The convenience of the two countries would obviously suggest that the ten-rupee piece should be coined of the same weight and fineness as the sovereign. Singularly enough, however, the agio upon gold in India which has actually prevailed has apparently blinded the eyes of the commission to this convenience, and by their virtual adoption of the suggestion that the golden multiple of the rupee should be calculated and minted with regard to the value of the rupee only, and apart from all other considerations, sovereigns being allowed to run for their relative value, they have taken rather the exchange, or bullion brokers' views of the question, than the views of those who consider that the gold coinage of England and of India might, with a certain degree of adjustment, made once for all, be easily rendered international. It is by no means clear whether the proposed golden rupees are to be minted at an average price of the British or Australian sovereign, as measured by the agio on gold in Calcutta, over a given period of years—say from 10½ to 10¾ rupees per sovereign—or whether the double standard is to be arranged by fixing on some stated proportion according to the best opinions upon the present relative values of gold and silver bullion in the open commercial markets of the world. The most recent price of the gold sovereign in India is 10 rupees and two annas, or 10½ rupees. This, expressed decimally, is 10.125 rupees per sovereign, or an agio of 1.25 per cent. above par. I would submit that, under these circumstances, the adoption of a par of exchange between our sovereign and 25 francs, by the reduction (explained in my pamphlet) of 0.825 per cent. in the intrinsic value of the sovereign, would bridge over this difficulty entirely. This reduction of 0.825 does not, obviously, quite at a moment remove the whole agio of 1.25 per cent., but it would do so practically in a very short time, as the introduction of a gold coinage into India would make gold commoner, and bring down this agio to its true level or remove it altogether.—I am, &c., FRANK HENDRIKS.

PRESERVED FRESH MEAT FROM AUSTRALIA.

The following account is taken from the *Sydney Herald* of September last. Mr. Morris, the gentleman named in the article, has arrived in this country, and states that the particulars, as given below, are substantially correct. Mr. Morris has offered to give further explanation on the subject to the Society's Food Committee:—

In a small nook, near the top of the winding valley of La Croza (not yet shorn of all its sylvan beauties in that part of it which opens into the low alluvial tract at Rushcutters Bay) stand the New South Wales Ice Company's Works, sheltered from hot winds and fervid afternoon sunshine, by steep banks of earth and ranges of rock. Cottages are rising here and there on the adjacent slopes, and imperfect outlines of streets are beginning to be visible in the green fields so long left untouched, to the left of the main road from Sydney to Paddington—near the site of the old toll-bar, and just beyond the Roman Catholic Church of the Sacred Heart. It is not a spot which presents any very peculiar local attractions, for everything is in that rather disagreeable transition state which seems to be inevitably antecedent to all material improvement and hopeful progress. Nevertheless, a number of gentlemen visited the Ice Company's

Works on Tuesday, and there gratified their curiosity and increased their knowledge by a personal inspection of Mr. Mort's meat-preserving apparatus—an invention which has been already guarded by Australian patents, and for which Mr. Morris is about to seek the additional protection of patents in England, in France, and in America.

About seven years since, when fat sheep and cattle were fetching but very low prices, Mr. Augustus Morris endeavoured in the neighbouring colony of Victoria to form an association of Australian stock owners, with the object of raising a sum of money sufficiently large to induce men of science to turn their attention to the discovery of some practical method by which the surplus fat stock of the colonies might be introduced into the European markets. Mr. Morris proposed that scientific experimental research should be particularly directed to the reduction of temperature, as likely to prove the readiest means for producing the desired results. His enterprising and far-sighted proposals were, however, not received with the favour which they deserved at the hands of the public; much witless ridicule being expended orally, and through the newspapers, in opposition to his idea—that it was here quite feasible to preserve meat by a freezing process, and thus to have it conveyed round the world, transported across the wide ocean to the other hemisphere, where the constant supply of millions with animal food is a problem which, year after year, becomes more difficult of solution. Satisfied that he had suggested the true mode of accomplishing the object he had in view, Mr. Morris was not to be deterred by the sneers of the conceited and ignorant, and ceased not to advocate the adoption of his idea. Rather better than two years ago, he became acquainted with Mr. Nicolle's method for producing cold, and felt convinced that he had at last met with the man who was, of all others, the most competent to realise his long cherished hopes in this direction. Mr. Nicolle, as we are given to understand, entered with commendable zeal into the matter, and expressed himself confident of being able to carry out all that was desired by Mr. Morris, who vainly endeavoured to interest other stockowners, so that a fair trial might be made, as a test of the proposed plan. The late Mr. J. D. McLean was, it would seem, the only person of note who thought favourably of it. Again, about twelve months ago, Mr. Morris invited public attention to this important subject by a circular which, in face of the success which has been realised, will doubtless be interesting to our readers. That document was as follows:—

"An experiment is about to be made for the preservation of meat by freezing without the use of ice, and without the meat being touched by any substance, except the iron tank containing it.

"Should the experiment be successful, an economical plan will have been devised, by which the superabundant meat of the Australian colonies can be introduced into the European and Asiatic markets in the same condition, both in regard to freshness and quality, as it is daily supplied in our own local markets. Ships can be fitted with the apparatus, by which, without injury to their capacity for carrying any other cargo, they can convey all over the world fresh meat for sale, or for the use of their crews and passengers during the voyages from and back to our ports, and without any risk of the meat spoiling.

"To give the plan a fair trial, the model, on which can be constructed, with greater certainty of success, the larger apparatus with which ships can be fitted for the conveyance of a partial or full cargo of fresh meat, will be made to contain about 7,870 lbs., or 3½ tons of meat. It is proposed to fill the model for the most part with beef and mutton, to avoid unnecessary expense, only leaving room enough for such fresh fish, poultry, game, &c., as will be required for a public dinner, to be given after the experiment is pronounced successful. The model will be submitted to the severest test the subscribers may themselves consider necessary; and unless it fulfils the conditions proposed their subscriptions will be returned.

"Messrs. Mort and Co. have kindly consented to act as treasurers, and will only disburse the funds as directed by a committee selected by the subscribers. On the completion (in about six weeks) of the model, Mr. Augustus Morris will read a paper explaining the theory of the proposed plan for preserving fresh meat, and its practical and economical adaptation to the purposes intended, and showing the manifold benefits which will follow, should its success be demonstrated.

"The co-operation of all interested is invited.

"Sydney, 13th September, 1866."

Still those whose interest it most certainly was to give every encouragement to the project held aloof; and a trial of its value might, perhaps, have been indefinitely postponed had not the matter been brought under the notice of Mr. Thomas S. Mort, who immediately appreciated the importance of the proposal, and, with characteristic liberality, offered to bear the whole expense of the necessary experiments. Since the time that Mr. Mort was known to have come to such a resolution, he, of course, has had to bear his share in the banting and discouragement previously lavished upon Mr. Morris and Mr. Nicolle. Notwithstanding many obstacles—arising principally from the want of right materials and men accustomed to the work—an admirable apparatus has been invented, constructed, and put in use by Mr. Nicolle—an apparatus capable of freezing several hundred tons of meat, and of keeping it in such a refrigerated state. The powers of the apparatus have been fully tested, and the invention has been crowned with a most triumphant success. Meat preserved in a perfectly fresh and uncooked state for months has been partaken of at the table of the governor, at the clubs, and in many private houses; and in all instances thus preserved has met with unqualified approval. It is, moreover, a remarkable fact that meat thus kept frozen neither loses flavour nor becomes putrescent immediately upon its thawing, as does meat preserved in ice, or frozen in the open air. On the contrary, it has been found that meat thus preserved, when suddenly released from the refrigerating influence to which it has been subjected, will keep as long as when obtained fresh from the butcher. Mr. Mort has obtained a patent for this invention under the laws of New South Wales, and has also applied for similar protection in other Australian colonies. The title of the invention is “A self-acting method of, and apparatus for, preserving fish, flesh, and fowl, and all other articles of food, by a process of refrigeration.” The inventor (Mr. Nicolle) in his specification filed in the Supreme Court of this colony, on which the patent here has been granted, states that—“The invention being an application of Faraday’s discovery of the liquefaction of certain gases by pressure, and the capacity of such gases for the absorption of heat on their release from liquefaction, has for its object the introduction of improved mechanical arrangements, whereby such gases may be employed to produce a temperature sufficiently low to secure the preservation of all articles of food. Although claiming the use of other liquefying gases, I claim and propose to work my apparatus by means of ammoniacal gas, which, by reason of its great solubility in water, and of the quantity of caloric which it absorbs in passing from the liquid to the gaseous state, and on account of its safety for use on shipboard, appears to be the most suitable agent to employ.”

The apparatus now in active use at the Ice Company’s Works has been set up in a shed on the eastern side of the yard, and is sufficient for preserving as much as 3,000 bullocks—or, say 1,000 tons of meat. The apparatus is more particularly designed for use on board ship, the whole of the machinery and fittings being so arranged that everything can be conveniently stowed away, and space so be properly economised. The larger portion of the apparatus is to be placed between decks, the feeders and desiccators, &c., where the water flows, being on deck, and the large meat receiver or receivers down below. The material used is ammonia—the liquid ammonia of commerce. This, being greatly rectified, is put into cylinders called “separators,” the quantity of absolute ammonia in such cylinders being indicated by glass gauges. From a small steam-boiler the steam is led by a coil which passes into a closed cylinder, called a “separator;” the object in using the steam being to heat the ammoniacal solution in the separator, and so to cause the ammonia to be volatilised—or, in other words, resolved into gas. So gasified, the ammonia is driven off from the water, and conveyed by a series of pipes, through a number of coils, into a bath or tank of water

on the deck of the vessel. The object of this is to refrigerate the gas, condensing the aqueous vapour (by which the ammonia is accompanied), so that it may return to the separators below. This particular portion of the apparatus is termed the “desiccator.” In the employment of cold water for this purpose, in the bath of the desiccator, a great economy is made available; the desired end—the “drying” of the gas—not being otherwise attainable, except by an expensive chemical process. The gas, being thus dried, is forced by the heat of the steam into an iron cylinder immersed in a bath (also on deck), and there, by pressure on itself—being a non-permanent gas—it becomes liquefied. This last-named vessel is called the “the liquid gas receiver.” From this receiver, the gas, in a liquid state, is passed by pipes into an outer compartment of the “meat-receiver,” a large double iron cylinder, as capacious as may be required. The meat-receiver of the apparatus at the Ice Works is a huge affair, somewhat resembling an enormous long cask outside, and, in its interior, not unlike a cavern. The meat-receiver is made with a double casing—so as to form a compartment intervening between the “cave” and the outer surface, its walls perfectly tight, to contain the liquefied gas supplied from the liquefied gas-receiver. This vessel is to be surrounded with some good non-conducting substance, such as charcoal, felt, or gutta-percha, enclosed in a wooden covering, painted or varnished, to exclude all moisture. The two shells of the cylinder are eccentric to each other, so that the inner shell rests on the bottom of the outer one, leaving at the top a space of about two inches. At the ends of the meat-receiver are two holes, big enough to give entrance to a man, through which the meat-receiver may be conveniently loaded or emptied. These orifices are made to fasten up with wooden covers or doors, which are fitted round their oval rims with gutta-percha, and securely attached into their proper places by means of screws.

Having thus given the reader an idea of the general nature of the apparatus, it remains for us now to attempt briefly to explain the *modus operandi*:—the manner in which the refrigerating gas is hereby generated, and conducted to the compartment surrounding the interior of the meat receiver, where its immediate effect is to cause everything to freeze which is deposited in that cavernous spot.

The gas, having been driven out of the “separator” by the heated water, is first forced by the heat (arising from the action of the steam supplied from the boiler) through two “coolers.” From the “coolers” it passes on, by a pipe, into an iron cylinder called the “re-absorber,” which is immersed in a water tank. The “separator,” being now again emptied, is again supplied with fresh ammoniacal solution from the “feeder” on deck, and the process is repeated. The re-absorber, now containing a weak solution, is prepared to receive the gas coming into it from the compartment round the meat receiver. It must be understood that ammoniacal gas has so great an affinity for water that water at 60 Fahrenheit will take up six hundred and seventy times its volume of gas. The consequence of this is that when, by opening a stopcock, admission for the gas to the water in the re-absorber is obtained, it rushes in with great violence, passing from its state of liquefaction into a gaseous form, and carries with it all the caloric or heat contained in the meat, &c., it has been surrounding. It is in this transition, when the liquid expands into a gaseous state, that the freezing, or complete refrigeration, takes place. Only as much ammonia is required at a time as will fill one of the series of receivers. From the special details of the apparatus, there is no loss whatever of the chemical substance employed. The compartment round the meat receiver is filled with the icy current from time to time, and emptied off by the stopcocks, until all the meat, &c., in the place is frozen with as much intensity as may be desired. The ammoniacal gas is capable of freezing 100 degrees below zero.

Beyond, at 103 below zero, however, that gas itself becomes solidified. To freeze a compartment on board ship containing one hundred tons of meat would be accomplished by Mr. Mort's apparatus at the ice works, invented by Mr. E. D. Nicolle, in about twelve hours. The particular apparatus we have been describing would take up about thirty tons of cargo space on board a ship. The refrigerating power attained by it is enormous, considering the small bulk of the apparatus. But Mr. Nicolle has discovered a modification which will reduce the size of the apparatus to one-third, and, at the same time, increase its refrigerating power tenfold.

The gentlemen who visited the self-acting meat preserver on Tuesday, and who ventured into the meat receiver, finally found themselves (as we have intimated) in a small cave, on the dark side of which the air was, in some places, condensed into snow an inch or two thick. All along the floor of the compartment tin buckets, from two to two and a-half inches across in their narrowest part, and about six inches high, stood full of, what appeared at first, by the dim light of the candle, to be water, but which, by the application of experimental fingers, were found to be full of solid ice. Fish, poultry, legs of mutton, saddles of mutton, and such other goodly provisions, were piled up near the entrance, and at the further end,—all frozen, hard as pieces of board, but sweet and good. Mr. Morris unlocked a large metallic box, and showed his friends a frozen rabbit, ready trussed for the table, and a fish which had come three weeks ago from Government-house, and was destined to be returned to that locality. Some of the meat there had been in that icy den for more than twelve months, some for six months, and some only for a week or two. The larders of most of the city clubs were well represented. The change from the hot winds outside to the sharp and frosty air of the receiver was, to say the least of it, a very remarkable sensation—one that could not be experienced without astonishment. On the whole, however, the visitors evidently preferred the warmth of the atmosphere of Australia, and wondered at the stoical indifference which Mr. Morris manifested for the intense cold. Mr. Mort claims eight things as peculiar to Mr. Nicolle's invention. First, the continuous operation of the apparatus without the use of any external force—beyond the occasional application of heat from a steam boiler; second, the mode in which he applies heat to the "separator;" third, the mode by which he rectifies the gases after liquefaction; fourth, the mode by which he removes the weak liquor from the "separator" into the "reabsorber" by its own pressure; fifth, the mode by which he sends up into the "feeder" the strong liquor from the "reabsorber;" sixth, the mode by which he returns the strong liquor into the "separator;" seventh, his admirable arrangement of the "meat receiver;" and, lastly, the arrangement he has made of what he calls the "portable meat preserver."

We are given to understand, that to Mr. T. S. Mort is due the honour of enabling this invention to be brought into practical application. The patience, the perseverance, and the liberality which he has displayed can only be fully appreciated by Mr. Nicolle and Mr. Morris. Day after day, week after week, month after month, Mr. Mort has watched the progress of the experiment, and by his cheerful encouragement and practical suggestions has contributed in a high degree to its satisfactory results. In fact, the portable meat preserver was wholly suggested by Mr. Mort.

Mr. Morris intends leaving for Europe by the present mail steamer.

PARIS EXHIBITION.

The *ouvriers délégués* of France are commencing the publication of their reports on the late Exhibition, the first announced being that of the bookbinders, which forms a volume of about 30 pages in 18mo.; the price is

fixed at 2-50 francs for Paris, and 3 francs for the departments; and in order that no one may find a difficulty in obtaining it, the sum may be paid or remitted in postage stamps by instalments; all applications are to be addressed to M. Ad. Clemence, 19, Rue des Juifs, Paris.

The vast building in the Champ de Mars is being rapidly cleared of its contents, and the operation has been facilitated by the fineness of the weather. Clearing out seldom presents much interest, but the other day a small object was taken away under peculiar circumstances; the carpenters of Paris exhibited a small temple, constructed in wood, as a specimen of fine workmanship, and which drew deserved admiration, and it was taken away the other day with much ceremony. More than five hundred affiliated carpenters, all in their best clothes, and each carrying a long wand, which is traditional with their corporation, appeared at the Champ de Mars, and, having received the model, carried it triumphantly to their head-quarters, at La Villette—"to their mother's house," to quote their own picturesque expression; a gay band of music preceding the procession, which had a fine effect as it passed along the whole length of the last of the great new thoroughfares, the Rue Lafayette prolonged.

It will not be out of place, now that the Exhibition is passing into history, to speak of two words which have come into use in connection with exhibitions, namely—*annex* and *exhibit*; the former was used by the commission in 1862 as written above, but of late it has been the fashion to add a final *e* because the word was taken directly from the French, but surely it is more logical to maintain the analogy of our own language, and write the new noun without the *e*, as we write affix, prefix, and suffix. The word *exhibit*, used as a noun, has been pronounced barbarous, but it has been in use for ages to represent a legal document exhibited. Where, therefore, is the objection to applying it to an object shown?

While on the subject of international Exhibitions we may mention the appearance of the fourteenth volume of the reports, or, to quote the official title, the *Travaux de la Commission Française sur l'Industrie des Nations*, on the Great Exhibition of 1851. The new volume forms a portion of the introduction by Baron Charles Dupin, which bears the title of "The Productive Force of Nations," and continues the subject of India, dealing with Bombay, the Punjab, Cashmere, and the Mahratta territory; the next volume is to be devoted to Madras, Mysore, Hyderabad, the Portuguese and French possessions, and Ceylon.

M. Dupin's introduction is a general review, not only of the commerce and resources, but also of the government and condition of the various people; and the volumes which treat of the British present great interest, as coming from a point of view different from our own. The delay in the publication of the volumes really adds to their value, as M. Dupin has thereby been able to avail himself of all events that have occurred during the sixteen years that have elapsed since the first great international exhibition occurred. The British rule in India finds a fearless, though not a one-sided critic in M. Dupin.

Fine Arts.

PARIS SALON, 1868.—The regulations for the next annual exhibition of pictures have just appeared. The *Salon* is to open as usual on the first of May, and to close on the 20th June; all works, whether by native or foreign artists, to be sent in between the 10th and 20th of March at the latest. The chief regulations are the same as they were last year: no artist can exhibit more than two works in any of the seven sections of painting, drawings, &c., sculpture, engraving, medal, and fine stone engraving, architecture, and lithography, but he may contribute to all or any of these sections. With respect

to the election of the jury, a great change has been made, this being entrusted, without any reserve, to the whole body of artists who have had a single picture admitted at any former exhibition except that of 1848, when there was no previous examination, and who send anything for the coming *Salon*, each artist voting only in his own section or sections.

Manufactures.

WOOLLEN MANUFACTURE IN ITALY.—The woollen industry in Italy has greatly declined from its ancient prosperity. Five centuries ago Florence alone produced woollen goods to the amount of 1,200,000 golden florins per annum, and gave employment to 30,000 persons. Venezia was formerly celebrated for dyeing cloths, especially crimson and scarlet, and, with Como and Bergamo, previous to the Austrian dominion, dyed 1,848,000 pounds of wool woven into cloth. Sheep are scarce in Italy, not numbering more than 8,804,918 in the whole kingdom. The best wool is from Ascoli, Chieti, Ancona, Foggia, Lucca, and Bari, whilst that of Messina, Reggio, and Porto Maurizio is inferior in quality. Besides the raw material produced in the country, 11,660,000 lbs. are imported, which, after being spun and woven, amount to £2,640,000 in value, of which sum £537,600 represents labour, dyeing, and other expenses. The mills are chiefly worked by water power, and the machinery is principally of Belgian make, and especially from Verviers. The most important manufactories of cloth are at Prato, Schio, and Biella.

Commerce.

AGRICULTURAL STATISTICS IN ITALY.—The Minister of Agriculture has recently addressed the various agricultural committees (*comitizi agrarii*) inviting them to furnish returns on the cultivation and production of corn in their respective provinces and communes. In his circular the minister states "that the average production of corn in other European countries varies from 23 to 25 hectolitres per hectare (about 25½ bushels to 28 bushels per acre), whilst average produce per hectare in Italy does not amount to more than from 10 to 12 hectolitres (or about from 11 to 13½ bushels per acre). If this produce could only be raised to 15 hectolitres per hectare (16·70 bushels per acre) Italy would cease to be dependent on other countries for one of the most important articles of food. Such results will be greatly facilitated by improvements in the manufacture and proper use of manures, to which the committees should especially turn their attention." In order to obtain exact returns of the production of corn, the following questions have been sent to the presidents of the committees:—1. The total amount of hectolitres produced in the commune at the last harvest (of 1867). 2. What is the average produce in hectolitres per hectare? 3. What is the average weight of a hectolitre of corn produced in the said commune? 4. What is the number of hectares at present sown with corn with a view to the harvest of 1868? 5. What is the average quantity of grain used for sowing per hectare? A subsidy of 100 francs (£4) has been given to each of the committees by the government, with a view to facilitate the collection of the data on the production and cultivation of the most important grain crops.

Colonies.

THE MANILLA FIBRE IN QUEENSLAND.—Another manufacture is about to be commenced in this colony. A firm is just commencing the manufacture of manilla fibre from the stalk of the banana. There is no reason

whatever why this branch of trade should not become an important one, as there is any quantity of the raw material, which, at present, is either used as manure for the young plants, or entirely thrown away. The same firm is also commencing the manufacture of starch from the sweet potato, and is thus opening up a market for a crop which can be grown with little trouble, and to any extent.

THE REVENUE OF NEW ZEALAND in the year 1866 was £1,343,951, and the total expenditure £1,345,753. The export of gold was valued at £2,605,000, against £2,858,000 in the year 1865. The expenditure for the years 1867-1868 is proposed as follows:—

| | |
|---------------------------------|----------|
| Permanent charges | £305,818 |
| Postal | 155,241 |
| Law and justice | 69,892 |
| Public departments | 45,025 |
| Customs | 44,810 |
| Miscellaneous | 39,403 |
| Militia and Volunteers | 28,052 |
| Native | 24,058 |
| Civil list | 27,500 |
| Public domains and buildings .. | 4,376 |

£744,175

Revenue is estimated at £1,084,000

Notes.

POPULATION OF BERLIN.—Berlin, in 1864, contained 633,000 inhabitants, of whom 22,000 were soldiers. Of the civil population, 302,304 were natives of Berlin; 44 per cent. were born in the provinces; 5 per cent. of other German countries; and 1 per cent. from abroad. Of 130,671 heads of families, 32 per cent. were born in Berlin, 67 per cent. elsewhere, and the origin of the remaining 1 per cent. is not known. As in all large towns, the immigrants form a large majority amongst the adult population: ecclesiastics, professors, &c., 1 per cent.; the working classes, 29 per cent.; traders and manufacturers, 18 per cent.; persons of independent means, 7 per cent.; and 12 per cent. individuals without any regular means of subsistence. The receipts of the municipality of the Prussian capital amount to 3,504,000 thalers, and the expenditure to 4,803,115 thalers. The octroi duties produce annually 748,261 thalers, and the tax on dogs, 53,500 thalers. Public instruction absorbs 721,939 thalers. The receipts for 1868 will be 145,017 thalers; and the expenditure 217,075 thalers more than that of the present year, and will constitute a total deficit of 1,661,207 thalers.

PARIS THEATRES.—The Paris theatres have had an exceptional time in consequence of the Exhibition, as will be seen by the comparative list of receipts during the seven months in which the Palace in the Champs de Mars remained open. The concerts, dancing rooms, and various exhibitions are as usual included in it:—

| | 1866. | 1867. |
|-----------------|------------------|-------------------|
| April | 2,029,937 francs | 1,710,788 francs. |
| May | 1,590,678 " | 2,285,725 " |
| June | 1,092,990 " | 2,240,976 " |
| July | 902,431 " | 2,289,896 " |
| August | 1,054,427 " | 2,246,306 " |
| September | 1,329,622 " | 2,702,752 " |
| October | 1,640,729 " | 2,876,917 " |

This difference in favour of 1867, is 6,893,148 francs for seven months, or (£40,000) per month. That the Exhibition season did not commence before the month of May is shown by the above figures, as the receipts for April, 1867, were less than of the same month in 1866.

REVENUE OF THE PRINCIPAL TOWNS IN FRANCE.—The *Moniteur* gives the following as the revenue of the twelve principal towns of the empire. Paris, 134,393,800 francs;

Marseilles, 11,218,938 francs; Lyons, 9,174,877 francs; Bordeaux, 9,066,222 francs; Rouen, 5,645,068 francs; Lille, 2,910,422 francs; Nantes, 2,495,263 francs; Toulouse, 2,225,860 francs; Havre, 2,215,583 francs; Toulon, 1,775,906 francs; St. Etienne, 1,729,492 francs; Strasbourg, 1,690,280.

Correspondence.

HOT DINNERS.—Sir,—With reference to Mr. Riddle's most excellent suggestions for supplying the working classes with hot-cooked meat from certain depôts, I would remark: 1st. That the system would be much appreciated by a large class not belonging to the working classes, viz., by a class, and a very numerous class it is, to whom the saving of £20, £30, or £50 a year constitutes the difference between being in easy circumstances or in difficulties; this applies especially to the poor upper classes, who rarely have any knowledge of how to economise. The lady of the house, for instance, orders a joint of meat, but is quite unable to calculate how many days or hours it should last. After the first day she declines to inspect the remains of the joint, but timidly asks cook if there is enough to last for the second day's dinner? and cook, in the great majority of cases, replies, "Oh! no, ma'm, not near enough." The lady rejoins, "Then just get in 2lbs. of steak to make up." "Yes, ma'm." When the butcher's book comes in on Monday, the aforesaid joint is found to have cost a fabulous sum; and the 2lbs. of steak ordered has swelled probably to 3lbs. 10oz., at 14d. a lb. Now, if it were once fixed what the proper weight of meat for a family, say of six, should be, I believe the consumer could save about one-third of the present cost of his butchers' meat by ordering daily the proper cooked allowance. 2nd. The system would admit of a much greater variety of food than can be now enjoyed easily. 3rd. It would tend to annihilate marine-store thieves, and put an end to a thousand little peculations, now peculiar to the "airy" department. 4th. To give a dinner to half-a-dozen dear friends or fashionable acquaintances would be an easy, agreeable, and inexpensive amusement, instead of, as at present, to all (except very rich people, who keep professed cooks) a source of unknown expense, and ludicrous or dangerous excitement. 5th. The system advocated would enable many to dispense with the most exacting and tyrannical class known to genteel but poor householders, viz., "good cooks." 6th, and lastly. The most wasteful of all domestic contrivances, kitchen ranges, might, if the system advocated were carried out, be sold off as old iron.—I am, &c., M. D.

MEETINGS FOR THE ENSUING WEEK.

MON......Entomological, 7.
Royal Inst., 2. General Monthly Meeting.
Society of Engineers, 7½. Adjourned discussion on paper by Mr. Arthur Rigg, jun., "On the Connection between the shape of Heavy Guns and their durability."
British Architects, 8.
Medical, 8.
Asiatic, 3.
TUES ...Civil Engineers, 8. 1. Mr. Wm. Wilson, "Description of the Victoria Bridge on the line of the Victoria Station and Pimlico Railway." 2. Mr. Charles Douglas Fox, "On New Railways at Battersea; with the Widening of the Victoria Bridge and Approaches to the Victoria Station."
Pathological, 8.
Anthropological, 8.
Syro-Egyptian, 7½. Mr. Samuel Sharpe, "On the Invasion of Palestine by the Assyrians and Babylonians."
WED ...Society of Arts, 8. Dr. Stallard, "On the Relation between Health and Wages."
Geological, 8. 1. Dr. H. A. Nicholson, "The Graptolites of the Skiddaw Series." 2. Dr. P. Martin Duncan, "The Fossil Corals of the West Indies." Part IV.
Pharmaceutical, 8.
R. Society of Literature, 4½.
Obstetrical, 8.
THUR ...Royal, 8½.
Antiquaries, 8½.

Linnæan, 8. 1. Mr. E. Ray Lankester, "Contributions to the Knowledge of the Lower Annelids." 2. Mr. C. A. Wilson, "On the *Moloch horridus* of S. Australia."
Chemical, 8. Mr. W. H. Perkin, "Artificial formation of Comnaric Acid."
FRISociety of Arts, 8. (Cantor Lectures.) Prof. Westmacott, "On Art, especially including the History and Theory of Sculpture."
Geologists' Association, 8.
Philological, 8.
Archæological Inst., 4.
SATR. Botanic, 3½.
Artists and Amateurs, 7. Annual Meeting.

PARLIAMENTARY REPORTS.

SESSIONAL PRINTED PAPERS.

Delivered on 23rd August, 1867.
Par. Numb.
476. Churches, &c. (Ireland)—Return.
496. Mines—Report and Evidence.
522. India Office—Order in Council.
536. Cathedral and Collegiate Churches—Return.
550. Browne's Charity—Report.
556. East India (Judges)—Return.
Delivered on 24th August, 1867.
482. Army (System of Retirement)—Report.
Delivered on 26th August, 1867.
523. Metropolitan Workhouses (Roman Catholic Children)—Return.
540. Navy (Iron Ballast)—Letter.
567. District Lunatic Asylums, &c. (Ireland)—Returns.
Delivered on 27th August, 1867.
Turkey—Reports on the Condition of Christians, Part II.
River Plate (No. 2)—Correspondence.
Public General Acts—Cap. 106 to 146.
Delivered on 28th August, 1867.
353. Ship "Northumberland"—Return.
520. Metropolis Gas Bill—Report.
Public Petitions—Supplement to Thirty-seventh Report.
Delivered on 3rd September, 1867.
Public General Acts—Cap. 125 (corrected).
Delivered on 12th September, 1867.
Ritual Commission—First Report of the Commissioners.
Delivered on 14th September, 1867.
470. Malt Tax—Report.
492. Industrial and Provident Societies—Return.
497. Oxford and Cambridge Universities Education Bill—Special Report.
521. Woodhouse Collection—Report, Evidence, &c.
Patagonia—Correspondence.
North America (No. 1)—Correspondence respecting British and American Claims.
Delivered on 16th September, 1867.
46. (vii.) Trade and Navigation Accounts (31st July, 1867).
450. East India (Land Revenue)—Return.
453. Military Reserve Funds—Report, Evidence, &c.
573. Register of Deeds (Middlesex)—Report.
Colonial Statistics—Statistical Abstract from 1852 to 1865, Third Number.
Births, Deaths, and Marriages—Twenty-eighth Annual Report.
Trades Unions and other Associations—Third Report of the Commissioners.
Delivered on 17th September, 1867.
46. (vii.) Trade and Navigation Accounts—Corrected Pages.
423. Grand Jury Presentments (Ireland)—Abstract of Accounts.
443. Sea Coast Fisheries (Ireland) Bill—Report.
492. (i.) Industrial and Provident Societies—Return.
508. Treasure Trove—Returns.
510. Joint Stock Companies—Returns.
514. Spirit Licenses—Returns.
537. Navy (Armour-clad Ships and Batteries)—Return.
539. Ship "Olivia"—Report.
554. Demerara Barracks—Report.
555. Places of Worship, &c.—Returns.
569. Terminable Annuities—Warrants.
570. Billingsgate Market—Return.
571. Farringdon Market—Return.
572. Poor Relief (Ireland)—Returns.
577. Weights and Measures—Return.
581. Poor Law (Ireland)—Correspondence.
Delivered on 19th September, 1867.
Public General Acts—Table.
Delivered on 21st September, 1867.
490. East India (Madras and Orissa Famine)—Return.
519. Public Accounts—Second Report.
544. Illicit Distillation—Returns.
553. Standing Orders.
Delivered on 23rd September, 1867.
301. (i.) Metropolitan Local Government, and Index to Reports.
541. War Department—Return.
Delivered on 24th September, 1867.
Manufactures, Commerce, &c.—Reports by Her Majesty's Secretaries of Embassy and Legation (No. 7, 1867).

Delivered on 25th September, 1867.
Trades Unions and other Associations—Fourth Report of the Commissioners.

- Delivered on 28th September, 1867.*
403. Savings Banks—Return.
431. (A III.) Poor Rates and Pauperism—Return (A).
471. Fire Protection—Report.
520. (1.) Metropolis Gas Bill—Index to Report.
531. Exchequer and Audit Departments Act—Minutes, &c.
547. Fees on Appointments, &c.—Treasury Minute.
549. Post Office—Returns.

Delivered on 3rd October, 1867.
46. (VIII.) Trade and Navigation Accounts (31st August).
551. Steam Ferries (Firth of Forth)—Return.

- Delivered on 5th October, 1867.*
495. (1.) Metropolis Subways Bill—Index to Minutes of Evidence.
515. Friendly Societies—Report of the Registrar.

Delivered on 7th October, 1867.
389. The "North"—Report of Mr. Montagu Bere.
Portugal and France—Treaty of Commerce.

Delivered on 8th October, 1867.
French Army in Algeria—Report on the Causes of Reduced Mortality

Delivered on 11th October, 1867.
Civil Service—Twelfth Report of the Commissioners.

- Delivered on 12th October, 1867.*
478. Army (India and the Colonies)—Report.
503. (1.) Ecclesiastical Titles and Roman Catholic Relief Acts—Index to the Report.
Exhibition of 1851—Fifth Report of Commissioners.

Delivered on 19th October, 1867.
446. Steam Vessels—Return.
574. East London Waterworks Company—Correspondence.

- Delivered on 24th October, 1867.*
431. (A IV.) Poor Rates and Pauperism—Return.
451. House of Commons (Arrangements)—Report and Evidence.
532. Abyssinia—Account.
568. Fortifications—Treasury Minute.
Rivers Pollution—Third Report of the Commissioners (Rivers Aire and Calder).

Delivered on 25th October, 1867.
507. Health of the Navy—Statistical Report.

Patents.

From Commissioners of Patents' Journal, November 22.

GRANTS OF PROVISIONAL PROTECTION.

- Boilers—3212—A. M. Clark.
Boilers, fuel feeding apparatus for—3131—R. Newton.
Bookbinding, &c.—3020—J. J. Perry.
Boots, knives, &c., cleaning and polishing—2935—J. J. Holden.
Boxes, anti-friction journal—3123—A. V. Newton.
Boxes, lubricating—3195—H. A. Bonneville.
Brakes—3119—A. M. Clark.
Bricks, &c., moulding—3196—H. A. Bonneville.
Buckles—3201—T. Evans.
Calculating apparatus—3117—C. E. Brooman.
Carriages for tramways, &c.—3144—C. H. Bright.
Cartridges—3187—W. R. Lake.
Casks, &c., bungs for—3204—L. A. Badin.
Castors—3188—W. R. Lake.
Chlorine, producing—3132—I. Baggs.
Cylinders, polishing—3126—R. Leake and J. Beckett.
Eye-preservers—3116—H. Adeane.
Fabrics, dyeing textile—3135—J. Botterill.
Fabrics, elastic—3173—C. Bedells.
Fabrics, narrow, arranging in boxes, &c.—3202—M. B. Westhead and R. Smith.
Fabrics, waterproof—3136—W. R. Lake.
Figures, &c., revolving apparatus for exhibiting—3156—H. Jewitt.
Files, manufacturing—2982—A. Chambers.
Fire-arms, breech-loading—3189—W. R. Lake.
Fire-arms, breech-loading—3214—W. R. Lake.
Fire-arms, breech-loading—3216—R. Adams.
Fire lighters—3194—J. C. Bayley and D. Campbell.
Flour—3140—T. J. Baker.
Flour and bread—3120—R. Palmer and H. S. Hird.
Fuel, artificial—3198—W. H. Crispin.
Furnaces—3133—E. and R. Thornton.
Furnaces—3168—E. B. Wilson.
Furnaces—3180—C. B. Hodgetts.
Furnaces—3200—C. E. Brooman.
Gas, &c., increasing light or heat from—2045—F. Wilkins.
Glass globes, &c.—3158—S. Landells.
Gloves—3149—J. Wheeler.
Grindstones—3193—F. and E. L. Ransome and H. Bessemer.
Gun cotton, treating—3127—E. C. Prentice.
Iron, rolling into bars, &c.—3184—T. J. Leonard.
Knitting machinery—3190—W. and W. Campion.
Label bands—3102—A. A. L. Harrison.
Labels, forming, printing, and counting—3147—I. Hewitt.

- Lace, &c., clipping—3109—W. Marshall.
Lamps—3162—S. A. Kirby.
Lamps—3171—M. Rollason.
Lamps—3172—T. W. Ingram and E. C. Kemp.
Lamps—3181—S. Buxton and W. Gardam.
Liquids, distilling, &c.—3148—J. F. Brinjes.
Locks—3166—S. Hall and M. Whittingham.
Looms—3113—T. Briggs, jun., and W. E. Yates.
Looms—3134—W. Pearson and W. Spurr.
Looms—3152—T. Blackburn.
Metal, &c., forming and working—2063—T. Berney.
Metal bolts, securing—3082—M. A. Soul.
Metal plates, feeding to rolls—3218—E. Madge.
Mineral oils, burning—3176—W. Lawrie.
Motive-power, &c.—3050—L. Perkins.
Mules for spinning, &c.—3101—H. Herden.
Omnibuses, &c.—3178—W. Thompson.
Panel doors and frames—3121—W. Geeves.
Paper, filtering—3150—R. Robinson.
Parasols—3167—H. Ellis.
Petroleum, &c., burning and distilling—3183—C. E. Brooman.
Pianofortes—3137—A. M. Clark.
Pontoons and rafts—3175—G. F. Parratt.
Postage stamps, &c., obliterating—2109—W. Wardep.
Printing machines—3186—W. R. Lake.
Printing rollers—3210—F. Andrew and E. Whittaker.
Pumps—3179—W. Payne.
Railway carriages, coupling—3163—W. Chippindale.
Railway points and signals—3128—T. F. Cashin.
Railways—3151—T. Clark.
Railways—3161—T. Wrigley.
Rocking-horses, &c., propelling—3125—J. W. R. Hill.
Shaft couplings—3159—W. Inglis.
Ships—3056—T. E. Symonds.
Ships, &c., armour for—3145—E. Sacré.
Ships, &c., armour for—3185—W. R. Lake.
Skins, clearing coarse hairs from—3065—E. Donner.
Smoke, consuming—3139—T. R. Bardsley and W. Blackshaw.
Steam governors—3138—C. L. Hett.
Surfaces, indicating horizontal, &c.—3154—I. McKimm.
Tables—3146—B. T. Newnham.
Telegraphs—2960—W. R. Lake.
Umbrellas, &c.—3115—H. Smyth.
Venetian blinds—3130—W. E. Gedge.
Votes, taking and registering—3174—G. Farren.
Webbs or bands, regulating the position of endless travelling—3153—G. Anderson.

INVENTIONS WITH COMPLETE SPECIFICATIONS FILED.

- Axles, conveying rotatory motion to—3271—K. J. Winslow.
Bricks, &c., making, drying, and burning—3220—P. E. Bland.

PATENTS SEALED.

- | | |
|-----------------------------------|---------------------------------|
| 1530. F. H. Johnson. | 1616. J. and J. Hinks. |
| 1532. C. W. Siemens. | 1663. T. Brown. |
| 1535. E. Howell and T. Hardy. | 1706. T. Holt. |
| 1536. S. and T. Atkinson. | 1822. E. McClintock. |
| 1552. J. M. Napier. | 1865. A. C. F. Franklin. |
| 1554. A. Oldroyd. | 1933. W. R. Lake. |
| 1556. I. Baggs and F. Braby. | 1943. H. Clarke. |
| 1559. W. P. Struvé. | 1958. H. Clarke. |
| 1575. H. A. Bonneville. | 2102. C. Klug. |
| 1581. L. H. Dethiou & F. Beaubry. | 2111. J. J. and E. Harrison. |
| 1585. W. J. Burgess. | 2257. L. V. Hue and C. Rozière. |
| 1606. J. Astbury. | 2587. J. R. Cooper. |
| 1607. W. Wood. | 2672. J. R. Cooper. |

From Commissioners of Patents' Journal, November 26.

PATENTS SEALED.

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|--------------------------------------|--------------------------------------|
| 1563. W. Affleck. | 1621. R. Reece. |
| 1567. W. H. Whettem and E. Walker. | 1622. J. Lancelott. |
| 1571. E. T. Hughes. | 1643. J. Waddington & B. Longbottom. |
| 1574. W. Coulson. | 1644. G. Davies. |
| 1580. W. Mitchell. | 1648. J. McOwen. |
| 1589. F. J. Brean. | 1653. T. H. Saunders. |
| 1593. F. B. Gage. | 1907. J. J. Lane. |
| 1594. T. E. Passoe. | 2485. A. V. Newton. |
| 1596. H. Turner. | 2582. H. Stewart. |
| 1597. E. Jones. | 2588. W. Brown. |
| 1620. Rt. Hon. J. Earl of Caithness. | |

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

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|-----------------------|-----------------------|
| 2888. J. Petrie. | 2910. G. Küttgen. |
| 2905. S. Bourne. | 2912. J. Snider, jun. |
| 2914. P. E. Gay. | 2917. R. Morrison. |
| 2926. J. S. Gisborne. | 2995. T. Harris. |
| 2985. H. Caunter. | 2949. J. Grundy. |

PATENTS ON WHICH THE STAMP DUTY OF £100 HAS BEEN PAID.

- | | |
|---------------------|---|
| 2862. R. Jobson. | 2886. J. H. Johnson. |
| 2867. G. E. Dering. | 2889. J. Fowler, jun., R. Burton, and D. Greig. |
| 2865. D. Auld. | |
| 2874. B. Beniowski. | 2907. J. S. Manton and T. Islip. |